Research Paper

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Study of Results of Ender nailing versus Interlock nailing in Fracture of shaft of Tibia

Medical Science

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ABSTRACT

Tibial shaft fractures are the most common long bone fractures owing to increase in vehicular and industrial accidents. Various treatment modalities are used in the management of this fracture which include conservative management with cast to intramedullary fixation to external fixation. We have studied outcome of total 40(30 male and 10 female) patients with fracture shaft of tibia operated with either Ender nailing or Interlock Nailing. All patients with average 36 months of follow up were assessed clinically and radiologically to compare results of Ender Nailing and Interlock Nailing. Union occurs in mean period of 10 weeks with 70% excellent and 25% good result in case of ender nailing while in interlock nailing union occurs in average period of 14 weeks with excellent result in 85% and good result in 15% of the patients. We concluded that neither Ender Nail nor Interlocking Nail proved to be superior to the other in the treatment of complex unstable Tibial shaft fracture.

INTRODUCTION

Tibial shaft fractures are the most common of the long bone fractures owing to increase in vehicular and industrial accidents . By its subcutaneous location throughout its length, open tibial factures are very common ; also considering its precarious blood supply and decreased soft tissue coverage, delayed union, nonunion and infection are very common and thus even today treatment of unstable shaft fractures remain difficult.1 Various treatment modalities are used in the management of this fracture which include conservative management with cast to intramedullary fixation to platting to external fixation.2,3,4

Concept of stabilization by intramedullary nailing is one of the greatest advancement in the treatment of long bone fracture which ranged from kuntscher nail5, ender nail6 and last the interlock nail7.

The advantages of intramedullary implants are:

- Closed procedure which preserves fracture hematoma and aids in fracture union with less chance of infection
- Good fixation and alignment of the fracture fragments without periosteal stripping
- Early ambulation and weight bearing
- Load bearing implants

We have compared the results of ender nailing and interlock nailing in the management of tibial shaft fracture during the period of July 2007 to July 2010.

Ender nail is a flexible nail that rely on three point fixation in the medullary canal and provide favorable mechanical condition as the forces are evenly distributed along the entire length of the nail. As the fixation by this nail is not rigid, therefore some amount of micro motion occurs between the two fragments which in turns stimulate fracture healing.

Interlock nail acts by splitage which may be seen as construct in which sliding can occur between the bone and implant. The interlocking screws provide rotational stability . The nail provide only relative stability without interfragmentary compression and allow some movement at fracture sight to produce scanty callus.

MATERIAL AND METHOD

We have done a retrospective comparative study of shaft of tibia fracture treated with Ender nail versus Interlock Nail. Our study included 40 patients (30 male and 10 female). Diagnosis is confirmed by the Antero-posterior and Lateral radiograph of involved limb as seen in fig I . We have used anatomical classification to classify the fractures.

Figure I: Pre operative radiographs

After general assessement of the patient routine blood investigation that include complete blood count, serum urea and creatinine, blood sugar and blood group are done as part of preoperative workup. Patient is taken in operation theatre and anaesthetised and shifted to fracture table in supine position with hip and knee 90° flexion. Fracture reduction is done under C-arm guidance. After confirming the reduction painting and drapping of operative area done.

In Ender nailing the medial portal of entry is 1-1.5cm below the medial tibial flare and medial to patellar tendon and lateral portal of entry is 1-1.5cm below the lateral tibial flare and lateral to patellar tendon. Gentle curvature is given at the tip of the nail to facilitate its passage into distal fragment. At least three nails are recommended for stabilization of fracture (Fig II).

Figure II: Ender nail(postoperative radiograph)

While doing interlocking nailing, 5cm incision was made just medial to tibial tuberosity extending proximally along the medial border of patellar tendon. Entry is taken with awl just medial and proximal to Tibial tuberosity. A guide pin is introduced after fracture reduction under C-arm guidance. After measuring the size, the nail is introduced into the tibia over guide pin. Distal and Proximal locking is done (Fig III).

Figure III: Interlock nail (Postoperative radiograph)

Postoperative protocol:

- Immediately after surgery, limb is supported by below knee slab.
- Injectable antibiotic is given for three days for close fracture and 5 days for open fracture in our institute.
- Analgesic is given as and when required.
- Quadriceps muscle strengthening exercise is started as soon as possible after surgery and bed side knee bending is started on next postoperative day.
- Sutures are removed on the 12th postoperative day.
- Hospital stay: Patient is discharged as soon as the wound and general condition of the patient is satisfactory- usually in 4 to 5 days.
- Partial weight bearing was delayed for minimum 10-12 weeks in case of Ender nailing while in Interlock nailing partial weight bearing can be started at 6-8 weeks.

OBSERVATION AND DISCUSSION

In our study of 40 patients 20 patients were below the age of 30 years while 20 patients were of more than 30 years and road traffic accidents were the most common cause of this fracture(90%).

Out of 40 cases 33 fractures were closed fractures while 7 were open fracutres. We observed that most fractures were found to be in lower third of the tibia(57.5%)

Ender nailing was done in 20 patients and interlock nailing was done in 20 patients. Partial weight bearing walking (PWBW) at six weeks was started in 7 patients operated with ender nails and only one patient operated with interlock nail. Full weight bearing walking (FWBW) was started at 12 weeks in 3 patients with ender nail and none of the patient with interlocking nail while during 12 to 18 weeks 17 patients with ender nailing and all 20 patients with interlock nailing had started full weight bearing walking.

Best criteria for judging the movement of hip and knee is ability to sit cross legged and to squat after clinical union. From the table III it is clear that sitting cross legged and squatting abilities are more in patients treated with interlock nailing as compared to ender nailing while the movements of ankle is found to be full in patients operated with ender nailing.

The union occurred in mean period of 10 weeks in case of ender nailing while It occurred in mean period of 14 weeks in patients treated with interlock nailing.

The rate of complications were very low in both study groups. Only two cases of infections- one from each group were found. Backing out of nail was seen in two patients of ender nailing. Shortening is seen in 12 patients with ender nailing while in interlock nail group it is seen in 8 patients.

It is seen that excellent results are achieved in 75% and 85% of patients with ender nailing and interlock nailing respectively.

CONCLUSION

From our study to compare the results of ender nailing and interlock nailing in fracture of shaft of tibia we come to the following conclusions.

- Bony union and early full weight bearing was more rapid with ender nailing.
- Activities of daily living and joint function were better performed by patients treated with interlock nailing.
- Ankle stiffness is more common in patients treated with interlock nailing.
- Shortening, valgus malalignment and rotational deformities were better controlled by interlock nails.
- The stability provided by interlock nail was superior to ender nail.

On comparing both modalities of treatment ,neither ender nail nor interlock nail proved to be superior to the other in the treatment of tibial shaft fractures. Both the systems have their own merits and demerits and both give good results when performed using correct technique; however when cost effectiveness is to be considered, which is a major factor for our patients, Ender nails would be a more suitable implant.

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